

# Smoke Management, Air Quality and Human Health

Integrated Ecosystem Research Workshop

June 12-15, 2017

Joseph W. Jones Ecological Research Center  
Newton, Georgia

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**Atlanta, GA**



# EPA's Role in Smoke Management

Under the Clean Air Act, EPA is tasked with protecting our nation's air quality from harmful pollutants

There are many potential sources of air pollution and many different kinds of pollutants

Both wild- and prescribed fires can increase air pollution in surrounding areas and can sometimes affect air quality regionally

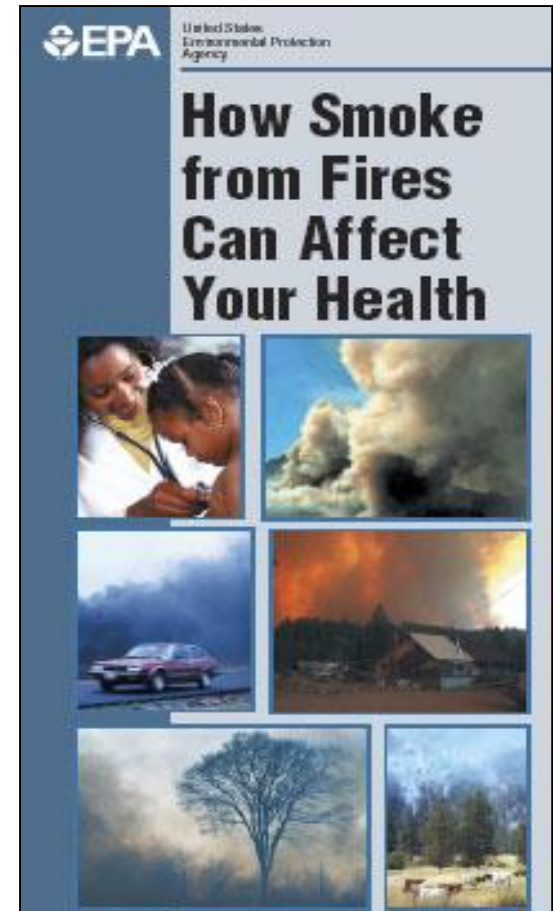


Courtesy of Sustaining the Environment and Resources for Canadians



# EPA's Role in Smoke Management

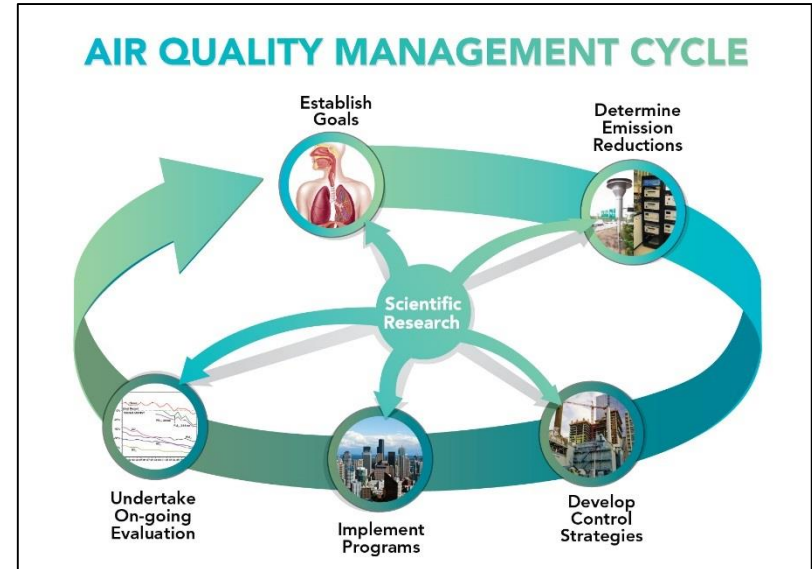
- The most significant health threat from smoke comes from fine particles (PM<sub>2.5</sub>)
- Exposure to PM<sub>2.5</sub> can have numerous human health effects:
  - premature death in people with heart or lung disease
  - nonfatal heart attacks and irregular heartbeat
  - aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing
- Other pollutants of concern in smoke include carbon monoxide, benzene, acrolein, formaldehyde, and precursors to ozone formation





# EPA's Role in Smoke Management

- EPA works to address air pollution caused by smoke in multiple ways:
  - Regulations, policies, and guidance
  - Voluntary Programs and Partnerships
  - Research





## Recent EPA Regulatory Activities with Fire-Related Components

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- October 2016 Exceptional Events Rule Revisions and Wildfire Ozone Guidance
- January 2017 Regional Haze Rule Revisions



Image from GA EPD Exceptional Event submittal to EPA November 2007



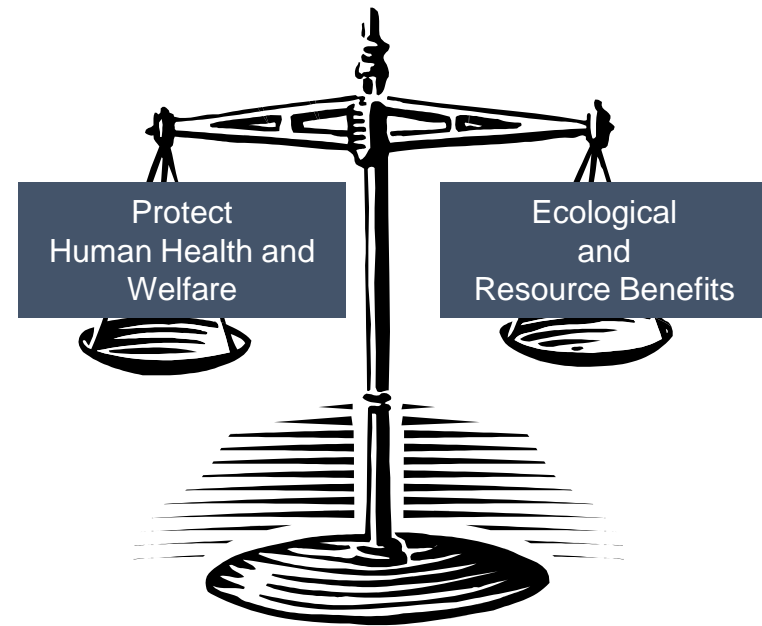
## EPA's 1998 Interim Air Quality Policy on Wildland and Prescribed Fires

### Attempts to Integrate 2 Public Policy Goals:

1. Allow fire to function in its natural role in maintaining healthy wildland ecosystems
2. Protect public health and welfare by mitigating the impacts of air pollutant emissions on air quality and visibility

Encourages collaboration among fire management agencies and air quality agencies

Encourages consideration of smoke management techniques and smoke management planning





# SERPPAS

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The Southeast Regional Partnership for Planning and Sustainability (SERPPAS) is a unique six-state partnership comprised of state and federal agencies, including EPA and DoD, that promotes collaboration in making resource-use decisions supporting conservation of natural resources, working lands, and national defense

- Started in 2005
- Includes States of NC, SC, GA, FL, AL, MS

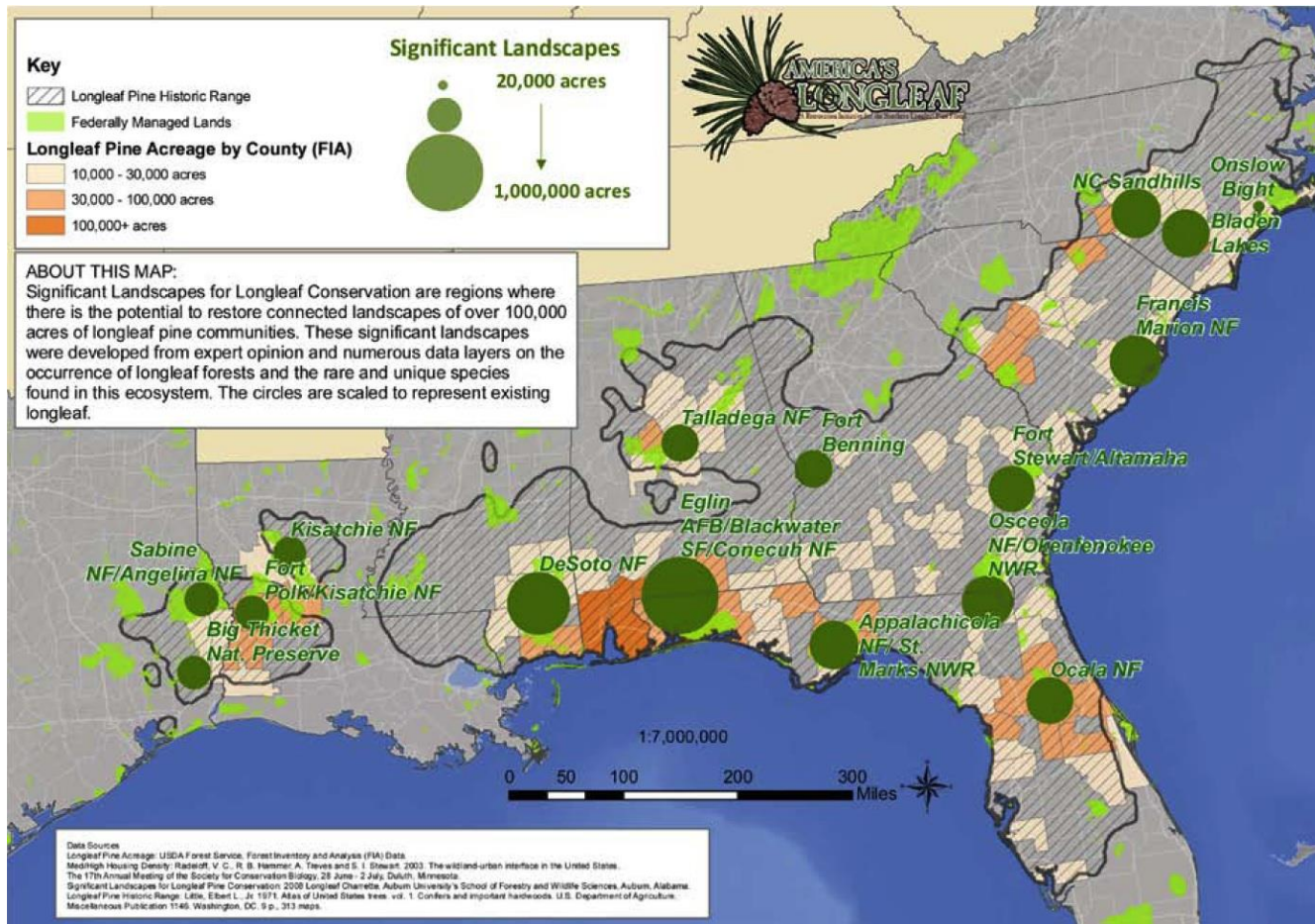


<http://serppas.org/>



# SERPPAS and Longleaf Pine Conservation

Vision: Increase 3.4 million acres to 8 million acres by 2025







# SERPPAS Wildland Fire Initiative

- Formed in 2011 by the SERPPAS Principals
- Currently facilitated by Jennifer Fawcett with NC State University
- Developed the 2012 *SERPPAS Comprehensive Prescribed Fire Strategy* to achieve the Long Leaf Pine Conservation and Restoration Vision of increasing long leaf pine acres from 3.4 million to 8 million by 2025

## Strategy Goals

- Ensure sufficient, consistently available resources to promote and implement increased prescribed fire operations
- Implement focused, effective communication, and education campaigns to increase awareness of prescribed fire and willingness to burn
- Increase the number of trained, qualified and experienced burners (both landowners and contractors) conducting prescribed burning on private and public lands
- Minimize landowners' risk of liability associated with prescribed fire
- Support prescribed fire programs on public lands
- Minimize local smoke impacts on air quality and public health and safety; Maximize coordination between air and fire communities
- Implement a consistent fire activity and emissions tracking system across the Southeast that is accessible to public and private burners
- Ensure coordination and collaboration at the regional, state, and local levels to implement the prescribed fire strategy



## SERPPAS Prescribed Fire Workgroup Activities and Products

- 2011 Smoke Management Recommendations and Prescribed Fire Tracking Document
- Prescribed Fire Smoke Management Pocket Guide and Mobile App
  - <http://smokeapp.serppas.org/>
- Communication and Outreach
  - Promote prescribed fire training for private landowners and education on long leaf pine
  - Promote prescribed burn associations to increase capacity to burn on private lands



**Southeast Regional Partnership for Planning  
and Sustainability (SERPPAS)  
Smoke Management Recommendations  
and  
Prescribed Fire Tracking**

SERPPAS Smoke Management and Air Quality Subcommittee  
November 16, 2011





## Southeast Prescribed Fire and Air Quality Workgroup

- Consists of State Air Directors and State Forestry Fire Chiefs for 8 Southeast States along with Regional partners
- Initiated in 2013, Co-lead by Jones Ecological Research Center, National Wildland Fire Council, and EPA Region 4
- Provides a forum to discuss state, regional, and national prescribed fire, smoke management and air quality goals and issues
  - First Prescribed Fire and Smoke Management Summit was in April 2013 at the Jones Ecological Research Center at Ichauway, GA
  - Summit II held February 2015 at Jones Center
  - **Summit III held April 2017 at Jones Center**
- Periodic Conference Calls among group





# Critical Research Question from Smoke Summit III

- Will a large increase in the number of prescribed fire acres burned have an adverse impact on air quality and human health in the Southeast?
- Information needed to answer this question
  - Accurate emissions inventory
  - Estimate of future frequency/location of prescribed burn acres
  - Robust air quality modeling tools
  - Population exposure and health impacts from prescribed fire smoke
  - Are Smoke Management Programs (SMPs) or Basic Smoke Management Practices (BSMPs) being used effectively?





## Another Important Research Question for the SE

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- How do the emissions from frequent prescribed fires compare to emissions from infrequent uncontrolled large wildfires?
- Important considerations:
  - Are pollutants of concern different?
  - Quantity of emissions
  - Atmospheric chemistry and transport of emissions
  - Pollutant concentrations
  - Number of people being impacted







## Wildland Fire Related Research

- **Toxicology studies** are ongoing to differentiate how wildland fire smoke impacts human health compared with a typical urban environment
- **Health communication** information “Wildfire Smoke: A Guide for Public Health Officials” is available at the AIRNOW wildland fire site
- **Smoke Sense App** development - intended to understand effective health risk communication strategies for people impacted by wildfire smoke
- **Wildland Fire Sensors Challenge** - intended to stimulate development of low-cost, light-weight, accurate, and easily deployable sensor technology for first responders and public health agencies during wildland fires
  - Learn more at <https://www.challenge.gov/challenge/wildland-fire-sensors-challenge/>
- **Improved emissions and air quality modeling of wild and prescribed fire**; recent field work in Flint Hills, KS for Region 7 RARE; early stages of planning field work and model development focused on prescribed burning in the southeast U.S.
- Working toward a **comprehensive survey/inventory of EPA research** related to wildland fire (wildland fire research prospectus)







## Local Air Quality Conditions

Zip Code:

Go

State:

Go

[My Current Location](#)

# Fires and Your Health

Smoke is made up of a complex mixture of gases and fine particles produced when wood and other organic materials burn. The biggest health threat from smoke is from fine particles. These microscopic particles can get into your eyes and respiratory system, where they can cause health problems such as burning eyes, runny nose, and illnesses such as bronchitis. Fine particles also can aggravate chronic heart and lung diseases - and even are linked to premature deaths in people with these conditions.

If you are healthy, you're usually not at a major risk from short-term exposures to smoke. Still, it's a good idea to avoid breathing smoke if you can help it. Everyone should take the steps below when wildfires are present.



Fires and smoke across Alaska and Northern Canada

[Archive Image courtesy of NASA Modis](#)

**Use common sense.** If it looks smoky outside, it's probably not a good time to mow the lawn or go for a run. And it's probably not a good time for your children to play outdoors.

**Pay attention to local air quality reports.** Stay alert to smoke-related news coverage or health warnings.

**Visit [AirNow](#)** to find out the Air Quality Index in your area. As smoke gets worse, the amount of particles in the air changes - and so do the steps you should take to protect yourself. AirNow recommends precautions you can take to protect your health when air pollution gets bad.

**If you are advised to stay indoors,** take steps to keep indoor air as clean as possible. When smoke levels are high, try to avoid using anything that burns, such as wood fireplaces, gas logs, gas stoves - and even candles! Don't vacuum. That stirs up particles already inside your home. And don't smoke. That puts even more pollution in your lungs, and in the lungs of people

around you.

If you have asthma or other lung disease, make sure you follow your doctor's directions about taking your medicines and following your asthma management plan. Call your doctor if your symptoms worsen.

**Run your air conditioner if you have one.** Keep the fresh air intake closed and the filter clean to prevent bringing additional smoke inside. Note: If you don't have an air conditioner, staying inside with the windows closed may be dangerous in extremely hot weather. In these cases, seek alternative shelter.

**If you have heart or lung disease, if you are an older adult, or if you have children,** talk with your doctor about whether and when you should leave the area. When smoke is heavy for a prolonged period of time, fine particles can build up indoors, even though you may not be able to see them.

To track wildfires across the U.S., go to [Fires: Current Conditions](#).

## Health Resources

- [Wildfire Smoke: A Guide for Public Health Officials, 2016](#) (76 pp., 1.5MB, [about PDF](#))
- [How Smoke from Fires Can Affect Your Health](#) - Learn steps you can take to protect your health.
- [Particle Pollution and Your Health](#) - Find out if you are at risk from exposure to particle pollution, and what health effects can be caused by particles.

## Educational Resources

- [CDC Wildfire Fact Sheet](#) - Information on emergency preparedness and response.
- [California Air Resources Board SMP Public Outreach Protocol - Tools and Materials](#)
- FOR KIDS- Follow [Smokey the Bear's advice](#) when wildfires are in your area!



# Don't miss...!



[www.epa.gov/research](http://www.epa.gov/research)

## science in ACTION

INNOVATIVE RESEARCH FOR A SUSTAINABLE FUTURE

### EPA Tools and Resources Webinar: Public Health Impact of Wildfire Smoke Emissions

June 21, 2017  
3:00 to 4:00 PM ET

#### Specific strategies to reduce smoke exposure and the Smoke Sense App

As the start of the summer wildfire season approaches, public officials, communities and individuals need up-to-date wildfire smoke health guidance to protect against related health risks. The 2016 (2017 final version available this fall) *Wildfire Smoke: Guide for Public Health Officials* serves as an easy-to-use source of information that outlines whose health is most affected by wildfire smoke, how to reduce exposure to smoke, what public health actions are recommended, and how to communicate air quality to the public.

The increasing size and severity of wildfire in the U.S. over the last three decades represents one of the complex environmental health challenges we face today that is best solved through the cooperation of local, state and federal government, public health organizations and individuals. This webinar presented by Wayne Cascio, M.D. will highlight updates to the Wildfire Smoke Guide, as well as the Smoke Sense app, which is a mobile application that gets air quality information to people impacted by wildfire smoke, and helps those affected learn ways to protect their health from smoke exposure. The app will be used in a study to determine effective health risk communications strategies to educate people impacted by wildfire smoke. This webinar will also discuss issues related to community vulnerability for health impacts from wildland fire, and it will provide updates on the Continuing Medical Education Course regarding Air Pollution and Your Patient's Health that will be hosted by CDC, providing continuing medical education credit.



#### Who should attend?

State environmental and health agencies, tribes, local governments, communities, stakeholders and others interested in learning about steps to reduce health effects from wildfire smoke emissions.

#### To join the webinar, please register:

<http://epawebconferencing.acms.com/wildfireguideupdate/event/registration.html>

If you are unable to listen through your computer speakers, please dial: 1-866-299-3188. Access Code: 202-564-6669.  
Please note, telephone lines are limited and muted during the webinar.

#### Additional information and webinar recordings can be found:

<https://www.epa.gov/research/epa-tools-and-resources-webinar-series>

Please contact Lisa Matthews ([matthews.lisa@epa.gov](mailto:matthews.lisa@epa.gov)) for more information or Amy Scheuer ([scheuer.amy@epa.gov](mailto:scheuer.amy@epa.gov)) with registration questions.



## Questions?

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